

at1121exam_practice EXAMPLE! DO NOT HAND IN FOR CREDIT (v10)

- If you are looking for a practice exam that you can hand in for credit:

<https://chadworley.github.io/algtwo2026/u04/1121/at1121exam/at1121exam.html>

Question 1

Simplify the radical expressions.

$$\sqrt{50}$$

$$\sqrt{63}$$

$$\sqrt{75}$$

$$\frac{\sqrt{5 \cdot 5 \cdot 2}}{5\sqrt{2}}$$

$$\frac{\sqrt{3 \cdot 3 \cdot 7}}{3\sqrt{7}}$$

$$\frac{\sqrt{5 \cdot 5 \cdot 3}}{5\sqrt{3}}$$

Question 2

Find all solutions to the equation below:

$$\frac{(x+9)^2 - 7}{3} = 31$$

First, multiply both sides by 3.

$$(x+9)^2 - 7 = 93$$

Then, add 7 to both sides.

$$(x+9)^2 = 100$$

Undo the squaring. Remember the plus-minus symbol.

$$x+9 = \pm 10$$

Subtract 9 from both sides.

$$x = -9 \pm 10$$

So the two solutions are $x = 1$ and $x = -19$.

Question 3

By **completing the square**, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 18x = -56$$

Take the linear coefficient, -18, halve it and square the result. You should get 81. Add this to both sides of the equation to complete the square.

$$x^2 - 18x + 81 = -56 + 81$$

$$x^2 - 18x + 81 = 25$$

Factor the perfect-square trinomial.

$$(x - 9)^2 = 25$$

$$x - 9 = \pm 5$$

$$x = 9 \pm 5$$

$$x = 14 \quad \text{or} \quad x = 4$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 3x^2 - 30x + 71$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 3 .

$$y = 3(x^2 - 10x) + 71$$

We want a perfect square. Halve -10 and square the result to get 25 . Add and subtract that value inside the parentheses.

$$y = 3(x^2 - 10x + 25 - 25) + 71$$

Factor the perfect-square trinomial.

$$y = 3((x - 5)^2 - 25) + 71$$

Distribute the 3.

$$y = 3(x - 5)^2 - 75 + 71$$

Combine the constants to get **vertex form**:

$$y = 3(x - 5)^2 - 4$$

The vertex is at point (5, -4).